

### REMARKS

Claims 1-32 are pending. Claims 33-50 have been canceled.

1. The Abstract was objected to for having more than 150 words. A replacement Abstract has been provided including not more than 150 words.

2. The Specification was objected to for improper reference to co-pending applications. Paragraphs [0007], [0045], [0087], and [0088] have been amended to include the patent number or patent application publication numbers of the co-owned and co-pending applications.

3. Claims 1-32 were rejected under 35 U.S.C. 101 for allegedly being directed to non-statutory subject matter.

Applicants respectfully object to the PTO's assertion that the claims are directed to non-statutory subject matter. For example, Applicants respectfully assert the subject matter of the claims has a practical application and is useful, concrete and tangible. Moreover, Applicants respectfully submit that method steps, such as "identifying a subset of the plurality of n-dimensional simplices" is not merely descriptive. However, in the interest of advancing prosecution, Applicants have amended claims 1-19. Claims 1-18 are presently directed to computer-implemented methods for constructing a representation ... for use with a computer graphical user interface. As such, Applicants respectfully submit that the subject matter of claims 1-18 is clearly statutory.

Claims 19-32 are directed to computer readable media. Computer readable media is statutory. As such, Applicants respectfully submit that the subject matter of claims 19-32 are clearly statutory.

4. Claims 2, 3, and 11 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite.

Claim 2 was rejected because the term "substantially coincident" is allegedly not clear. The term "substantially coincident" refers to the faces of subdivided simplices, which closely approximate a surface (see paragraph [0056]). Applicants respectfully submit that in the context of claim 2, the term "substantially coincident" is clear.

The subject matter of claims 3 and 4 are described in relation to FIGs 6 through 12. As defined by YourDictionary.com, the term "collapse" means to cause to fold or break down. Such a definition has a clear and definite meaning when modifying a simplex. As also defined by YourDictionary.com, the term "invariant" means unaffected by a designated operation, as a transformation of coordinates. Claim 4 further presents a method step for collapsing, enhancing the clarity and definiteness of the term "collapsing." Regarding claim 11, Inria is a term of art and is clearly described in paragraph [0047].

5. Claims 1-50 were rejected under 35 U.S.C 102(a) as anticipated by Edwards, and clarified by Gibson.

Claim 1 is directed to a computer-implemented method for constructing a representation of a first system for use with a computer graphical user interface. The first system is represented by a first finite element mesh. A second system is within the first system. The second system is represented by a second finite element mesh. The method includes constructing the first finite element mesh having a plurality of n-dimensional simplices corresponding to the first system; defining a surface bounding said second system; identifying a subset of the plurality of n-dimensional simplices of the first finite element mesh that are intersected by the surface; modifying the identified subset of the plurality of n-dimensional simplices to adapt the first finite element mesh such that it comprises the second finite element mesh and a third finite element mesh, wherein the second finite element mesh comprises a first set of simplices located entirely interior to the surface and wherein the third finite element mesh comprises a second set of simplices located entirely exterior to the surface; and displaying the first finite element mesh in the computer graphical user interface. Claims 19 includes method steps of claim 1.

The PTO appear to rely on the abstract of Edward and specifically on the step of "impos[ing] a fine scale unstructured grid about the perforated sections of the specific wellbore." Edwards fails to teach identifying a subset of the plurality of n-dimensional simplices ... that are intersected by a surface and modifying the identified subset of the plurality of n-dimensional simplices. However, the PTO states that "impose" inherently requires selecting a region in which to impose said fine scale structured grid and that "impose" inherently requires identifying and breaking the mesh segments that intersect the bounding surface. However, "impose a fine

scale unstructured grid" does not necessarily require selecting a region and identifying and breaking mesh segments. As such, "impose a fine scale unstructured grid" does not inherently require selecting a region and identifying and breaking mesh segments.

The PTO appears to rely on Gibson to clarify the term "impose" of Edwards. However, Gibson is silent regarding the term "impose" and Gibson nowhere describes how to "impose a fine scale unstructured grid" in detail. In fact, the PTO's assertions imply that "impose" is equivalent to "superimpose," which implies to lay or place on or over something (see [YourDictionary.com](http://YourDictionary.com)).

In contrast, a fine scale unstructured grid may be imposed by simply defining a new grid in a given area or space without identifying and breaking mesh existing segments (i.e. modifying an identified subset of simplices). Such an alternate definition of "impose" provides unequivocal evidence that "impose" does not inherently require selecting a region and identifying and breaking mesh segments or modifying an identified subset of simplices.


For at least the foregoing reasons, Applicants respectfully submit that the claimed invention is not anticipated by Edwards as clarified by Gibson. Accordingly, reconsideration of this rejection is respectfully requested.

Applicants respectfully submit that the present application is now in condition for allowance. Accordingly, the Examiner is requested to issue a Notice of Allowance for all pending claims. Should the Examiner deem that any further action by the Applicants would be desirable for placing this application in even better condition for issue, a call to the Applicants' representative listed below is requested.

Applicants do not believe that any additional fees are due, but if the Commissioner believes additional fees are due, the Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-2469.

Respectfully submitted,

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Date

  
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